

SMNSR-UO-000817-2016.001

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Chipeta Processing LLC
P.O. Box 173779, Denver, Colorado 80217-3779
720-929-6000 Fax 720-929-7000

November 4, 2016

SENT VIA CERTIFIED MAIL No.:

7014 3490 0001 8054 0275

Ms. Claudia Smith
U.S. EPA, Region 8
1595 Wynkoop Street, 8P-AR
Denver, CO 80202-1129

**RE: Synthetic Minor NSR Permit Application under Part 49
Archie Bench Compressor Station**

Dear Ms. Smith:

Anadarko Uintah Midstream, LLC (Anadarko) is submitting the attached permit application under Part 49 Minor NSR rules for the Archie Bench Compressor Station located in Uintah County, Utah. Anadarko is submitting this minor source application to establish federally enforceable limits as required by the Civil Action No. 07-CV-01034-EWN-KMT (KMG Consent Decree).

The attached application contains the following:

- Appendix A: EPA Form New
- Appendix B: EPA Form SYNMIN
- Appendix C: Process Description, Flow Diagram, and Plot Plan
- Appendix D: Emission Unit and Emission Control Descriptions
- Appendix E: Emission Summary
- Appendix F: Detailed Emission Calculations
- Appendix G: Regulatory Analysis

Sincerely,

Anadarko Uintah Midstream, LLC




Natalie Ohlhausen
Sr. HSE Representative

Enclosures

Appendix A

Form NEW

(Application for New Construction)

	United States Environmental Protection Agency Program Address Phone Fax Web address	<i>Reviewing Authority</i> Program Address Phone Fax Web address
FEDERAL MINOR NEW SOURCE REVIEW PROGRAM IN INDIAN COUNTRY Application for New Construction (Form NEW)		
<p>Please check all that apply to show how you are using this form:</p> <p> <input type="checkbox"/> Proposed Construction of a New Source <input type="checkbox"/> Proposed Construction of New Equipment at an Existing Source <input type="checkbox"/> Proposed Modification of an Existing Source <input checked="" type="checkbox"/> Other – Please Explain </p> <p>Existing Source operating under synthetic minor limits, as regulated under Consent Decree, submitting an application for a synthetic minor permit under Part 49.</p>		

Please submit information to:

Ms. Claudia Smith
U.S. EPA Region 8
1595 Wynkoop Street, 8P-AR
Denver, CO 80202-1129

A. GENERAL SOURCE INFORMATION

1. (a) Company Name Anadarko Uintah Midstream LLC (b) Operator Name Anadarko Uintah Midstream LLC		2. Source Name Archie Bench Compressor Station	
3. Type of Operation Nat.Gas Compression & Transmission		4. Portable Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 5. Temporary Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
6. NAICS Code		7. SIC Code 1311	
8. Physical Address (home base for portable sources)			
9. Reservation* Uintah and Ouray	10. County* Uintah	11a. Latitude* 39.956212° N	11b. Longitude* -109.41146 ° W
12a. Quarter Quarter Section* SW SW	12b. Section* 12	12c. Township* 10S	12d. Range* 22E

*Provide all proposed locations of operation for portable sources

B. PREVIOUS PERMIT ACTIONS (Provide information in this format for each permit that has been issued to this source. Provide as an attachment if additional space is necessary)

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

C. CONTACT INFORMATION

Company Contact Mike Weaver		Title Midstream Operations Manager	
Mailing Address P.O.Box 173779, Denver, CO 80202-3779			
Email Address Mike.Weaver@anadarko.com			
Telephone Number 720-929-6792		Facsimile Number	
Operator Contact (if different from company contact) Andy Zeller			Title Plant Foreman
Mailing Address			
Email Address andy.zeller@anadarko.com			
Telephone Number 435-781-7001		Facsimile Number	
Source Contact Natalie Ohlhausen			Title Sr. HSE Representative
Mailing Address P.O.Box 173779, Denver, CO 80202-3779			
Email Address Natalie.Ohlhausen@Anadarko.com			
Telephone Number 720-929-6498		Facsimile Number	
Compliance Contact Same as Source Contact		Title	
Mailing Address			
Email Address			
Telephone Number		Facsimile Number	

D. ATTACHMENTS

Include all of the following information (see the attached instructions)

- ☒ **FORM SYNMIN** - New Source Review Synthetic Minor Limit Request Form, if synthetic minor limits are being requested.
- ☒ Narrative description of the proposed production processes. This description should follow the flow of the process flow diagram to be submitted with this application.
- ☒ Process flow chart identifying all proposed processing, combustion, handling, storage, and emission control equipment.
- ☒ A list and descriptions of all proposed emission units and air pollution-generating activities.
- ☒ Type and quantity of fuels, including sulfur content of fuels, proposed to be used on a daily, annual and maximum hourly basis.
- ☒ Type and quantity of raw materials used or final product produced proposed to be used on a daily, annual and maximum hourly basis.
- ☒ Proposed operating schedule, including number of hours per day, number of days per week and number of weeks per year.
- ☒ A list and description of all proposed emission controls, control efficiencies, emission limits, and monitoring for each emission unit and air pollution generating activity.
- ☒ **Criteria Pollutant Emissions** - Estimates of Current Actual Emissions, Current Allowable Emissions, Post-Change Uncontrolled Emissions, and Post-Change Allowable Emissions for the following air pollutants: particulate matter, PM₁₀, PM_{2.5}, sulfur oxides (SO_x), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist (H₂SO₄), hydrogen sulfide (H₂S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates.

These estimates are to be made for each emission unit, emission generating activity, and the project/source in total.
- ☐ **Modeling – Air Quality Impact Analysis (AQIA)**
- ☐ **ESA (Endangered Species Act)**
- ☐ **NHPA (National Historic Preservation Act)**

E. TABLE OF ESTIMATED EMISSIONS

The following tables provide the total emissions in tons/year for all pollutants from the calculations required in Section D of this form, as appropriate for the use specified at the top of the form.

E(i) – Proposed New Source

Pollutant	Potential Emissions (tpy)	Proposed Allowable Emissions (tpy)	
PM		0 . 0	PM - Particulate Matter PM ₁₀ - Particulate Matter less than 10 microns in size PM _{2.5} - Particulate Matter less than 2.5 microns in size SO _x - Sulfur Oxides NO _x - Nitrogen Oxides CO - Carbon Monoxide VOC - Volatile Organic Compound Pb - Lead and lead compounds Fluorides - Gaseous and particulates H ₂ SO ₄ - Sulfuric Acid Mist H ₂ S - Hydrogen Sulfide TRS - Total Reduced Sulfur RSC - Reduced Sulfur Compounds
PM ₁₀		0 . 0	
PM _{2.5}		0 . 0	
SO _x			
NO _x		58 . 4	
CO		23 . 2	
VOC		20 . 5	
Pb			
CO _{2e}		17464 . 3	
Fluorides			
H ₂ SO ₄			
H ₂ S			
TRS			
RSC			


Emissions calculations must include fugitive emissions if the source is one the following listed sources, pursuant to CAA Section 302(j):

- (a) Coal cleaning plants (with thermal dryers);
- (b) Kraft pulp mills;
- (c) Portland cement plants;
- (d) Primary zinc smelters;
- (e) Iron and steel mills;
- (f) Primary aluminum ore reduction plants;
- (g) Primary copper smelters;
- (h) Municipal incinerators capable of charging more than 250 tons of refuse per day;
- (i) Hydrofluoric, sulfuric, or nitric acid plants;
- (j) Petroleum refineries;
- (k) Lime plants;
- (l) Phosphate rock processing plants;
- (m) Coke oven batteries;
- (n) Sulfur recovery plants;
- (o) Carbon black plants (furnace process);
- (p) Primary lead smelters;
- (q) Fuel conversion plants;
- (r) Sintering plants;
- (s) Secondary metal production plants;
- (t) Chemical process plants
- (u) Fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input;
- (v) Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels;
- (w) Taconite ore processing plants;
- (x) Glass fiber processing plants;
- (y) Charcoal production plants;
- (z) Fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, and
- (aa) Any other stationary source category which, as of August 7, 1980, is being regulated under section 111 or 112 of the Act.

Appendix B

Form SYNMIN

(Application for Synthetic Minor Limit)

 <p>United States Environmental Protection Agency Program Address Phone Fax Web address</p>	<p>Reviewing Authority Program Address Phone Fax Web address</p>
<p>FEDERAL MINOR NEW SOURCE REVIEW PROGRAM IN INDIAN COUNTRY</p> <p>Application For Synthetic Minor Limit (Form SYNMIN)</p>	

Please submit information to:

Ms. Claudia Smith
U.S. EPA Region 8
Air and Toxics Division
1595 Wynkoop
Denver, CO 80202-1129

A. GENERAL INFORMATION

Company Name Anadarko Uintah Midstream LLC	Source Name Archie Bench Compressor Station	
Company Contact or Owner Name Mike Weaver	Title Midstream Operations Manager	
Mailing Address P.O.Box 173779, Denver, CO 80202-3779		
Email Address Mike.Weaver@anadarko.com		
Telephone Number 720-929-6792	Facsimile Number	

B. ATTACHMENTS

For each criteria air pollutant, hazardous air pollutant and for all emission units and air pollutant-generating activities to be covered by a limitation, include the following:

- ☒ **Item 1** - The proposed limitation and a description of its effect on current actual, allowable and the potential to emit.
- ☒ **Item 2** - The proposed testing, monitoring, recordkeeping, and reporting requirements to be used to demonstrate and assure compliance with the proposed limitation.
- ☐
- ☒ **Item 3** - A description of estimated efficiency of air pollution control equipment under present or anticipated operating conditions, including documentation of the manufacturer specifications and guarantees.
- ☐
- ☒ **Item 4** - Estimates of the Post-Change Allowable Emissions that would result from compliance with the proposed limitation, including all calculations for the estimates.
- ☒ **Item 5** - Estimates of the potential emissions of Greenhouse Gas (GHG) pollutants:

Appendix C

Process Description, Process Flow Diagram, & Plot Plan

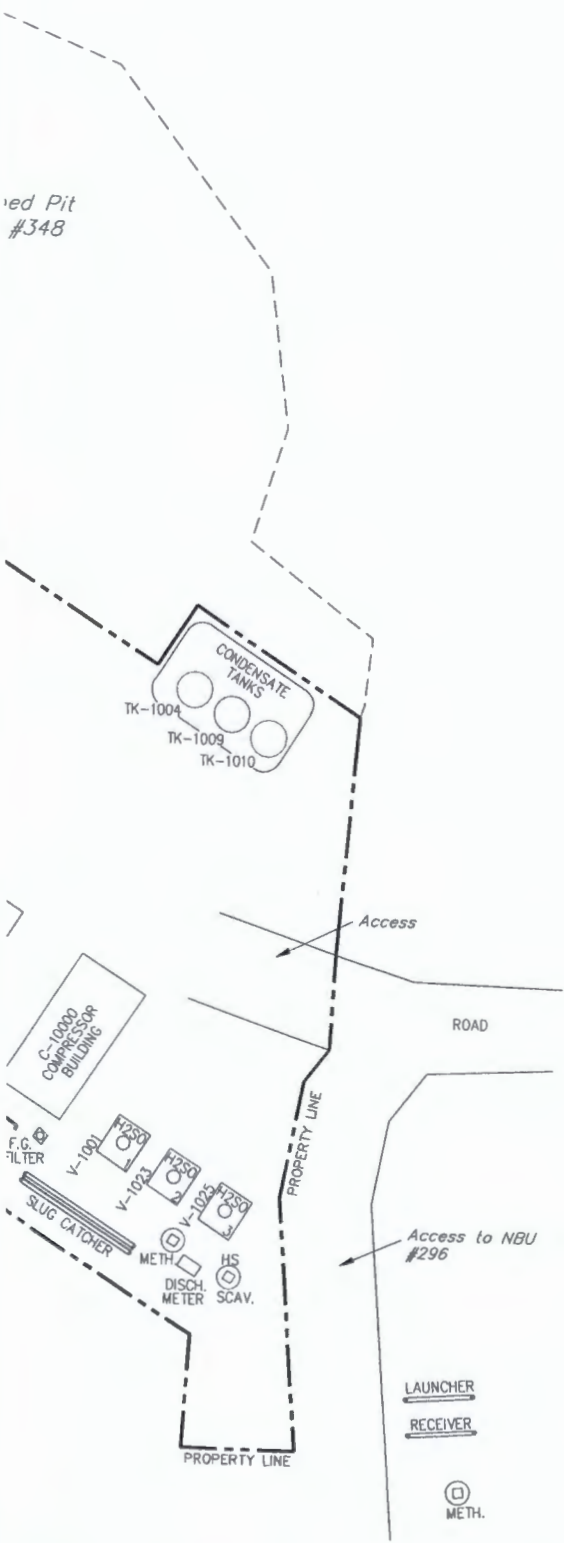
Process Description

Anadarko Uintah Midstream LLC (Anadarko) owns and operates the Archie Bench Compressor Station (Archie Bench), within the exterior boundaries of the Uintah and Ouray Indian Reservation, in Uintah County, Utah.

Natural gas from the surrounding field is routed to the compressor station via the gas collection system. Natural gas enters the compressor station through the inlet slug catcher where liquids are gravitationally separated from the stream. Condensate recovered is sent to the blowcase system and put back into the discharge line leaving the station. Gas goes through two stages of compression before discharge from the facility. Water is stored in the atmospheric storage tanks along with condensate collected. Liquids are held in storage tanks onsite until loaded into trucks for transport to sale.

Archie Bench operations consists of:

- Three Caterpillar G3516 compressor engines (ARB1, 2 and 3),
- Three H₂S Strippers (T-1002, T-1024, and T-1026)
- Three produced water tanks (Tank-1004, 1009, and 1010)
- One truck loading area
- One 0.25 MMBtu/hr line heater (H-1012)
- Piping components (FUG)



3/01/12					
5/13/08	ES				
3/23/05	ES				
1/28/05	ES				
11/22/04	ES				
DATE	CHK.	DATE	APPR.	DATE	



ARCHIE BENCH COMPRESSOR STATION

ARCHIE BENCH COMPRESSOR STATION PLOT PLAN

DRAWN BY: NHL	CREATION DATE: 6/12/08	A/E No.:
APPROVED: -	APPR. DATE:	
DWG. No.:	U10-GP-01	
SCALE: NONE	SHEET No. - OF -	2

PLOT STYLE:

BY:

LAST SAVED:

FILE LOCATION: N:\DWG\U10 ARCHIE BENCH\U10-GP-01.dwg

SC

PLOT STYLE:



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V-1000
INLET SEPARATOR

C-100000
COMPRESSOR

V-1007
INLET SEPARATOR

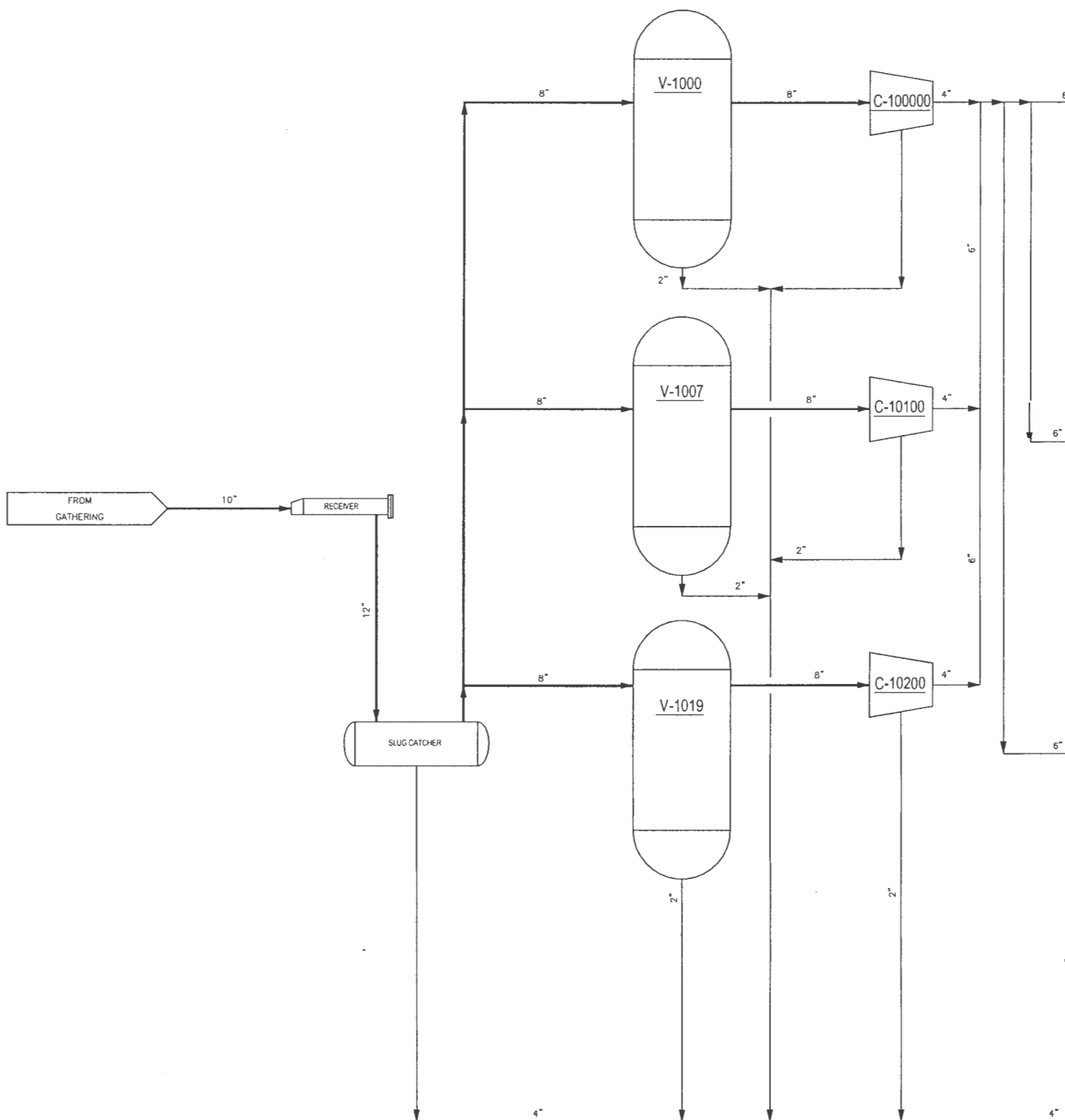
C-10100
COMPRESSOR

V-1019
INLET SEPARATOR

C-10200
COMPRESSOR

V-1001
DISCH. SEPARATOR

H2S



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NOTES:

REFERENCE DRAWINGS

REVISIONS

AS-BUILT
ISSUED AS-BUILT
COMPRESSOR, C-10000 REMOVED
PHA REVIEW
AS-BUILT WITH 2005 EQUIPMENT ADDITIONS
AS-BUILT

DWG. NO.	TITLE	NO	DESCRIPTION

Appendix D

Emission Unit Description

CO Emissions:

As per the Kerr-McGee ("KMG") Consent Decree, KMG is requesting to make the emission limits outlined in paragraphs 41 and 50 federal enforceable as required by paragraph 167. All engines located at the Archie Bench Compressor Station are fitted with oxidation catalyst which demonstrate a control efficiency of 93% is required for these RICEs as per the Kerr-McGee Consent Decree (*paragraphs 41 and 50*).

KMG is requesting the control requirements for CO in the Consent Decrees be incorporated as permit conditions.

- Proposed limits

CO emission control efficiency of 93% for Engines ARB 1 (C-10000), ARB 2 (C-10100), and ARB 3 (C-10200)

- Proposed testing

- Initial Testing

- Swap-outs and Like-kind Replacement Engines

- Initial compliance test shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup.

- Test Methods:

- Measure the O₂ and CO at the outlet of the control device using portable analyzer. Use ASTM D6522-00 (2005), Method 10 of 40 CFR appendix A, or some other EPA approved Method for CO. Measurements to determine O₂ must be made at the same time as the measurements for CO concentration.
 - Convert to g/hp-hr using Method 19 and the manufacturer's specific fuel consumption or measured fuel consumption and horsepower at the time of the testing.
 - Conduct one (1) test run for each performance test required. Each test run must last at least 21 minutes

- Ongoing Testing

- Semi-annual or annual testing must be completed to verify compliance with g/hp-hr limits. Existing engines currently follow a semi-annual testing schedule. After permit issuance, if there is documented history of two consecutive, passing compliance tests, the testing frequency shall be reduced to annually. Overall, the testing frequency will not be reduced to annual tests until there are two consecutive, passing compliance tests (taking into account pre-permit, compliant tests). Total facility CO emissions shall be calculated based on the results of the latest test and 8,760 hours per year of operation. Should there

be a failed test, testing will resort to semi-annual testing. Two compliant semi-annual tests will be required before reverting to annual testing. Semi-annual tests must be completed within 180 days of permit issuance and annual tests must be completed within 365 days of permit issuance. Subsequent semi-annual and annual tests must occur anytime within the January to June and July to December semi-annual period or calendar year period, for semi-annual and annual testing, respectively. This means there will be instances where the time in between semi-annual tests may exceed 180 days and the time in between annual tests may exceed 365 days.

- Test Methods:
 - Measure the O₂ and CO at the outlet of the control device using portable analyzer. Use ASTM D6522-00 (2005), Method 10 of 40 CFR appendix A, or some other EPA approved Method for CO. Measurements to determine O₂ must be made at the same time as the measurements for CO concentration.
 - Convert to g/hp-hr using Method 19 and the manufacturer's specific fuel consumption or measured fuel consumption and horsepower at the time of the testing.
 - Conduct one (1) test run for each performance test required. Each test run must last at least 21 minutes
- Reporting Requirements
 - Notification of performance test shall be submitted 30 days prior to the date of the performance test.
 - Test reports shall be submitted within 60 days of completion of any compliance test.
- Operation and Maintenance Requirements
 - At all times, the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.

Formaldehyde Emissions:

- This facility is a not major source of HAPs and is therefore not subject to the major source requirements of NESHAP Subpart ZZZZ. Therefore, no limits are being requested.

NOx Emissions:

- This facility NO_x emissions are below the PSD threshold and, therefore, no limits are being requested.

VOC Emissions:

- Engines
 - VOC emissions based off manufacture's information. Total facility emissions are below the PSD threshold and, therefore, no limits are being requested.
- Produced Water Tanks
 - The produced water tanks at this station collect minimal condensate volumes. The VOC emissions from each tank are estimated based on process model to less than 6tpy.
 - Recordkeeping
 - Shall maintain records and information adequate to demonstrate its compliance with the requirements of this permit for five years.
- Pneumatic Controllers
 - Permit Limit:
 - All pneumatic controllers shall be "low bleed" controllers.

Appendix E
Emission Summary

Facility: Archie Bench Compressor Station

Location: Section 12 T10S R22E

Uncontrolled Emissions (TPY)											
Unit ID	Description	NOx	CO	VOC	PM10	CO2e	CH2O	Acetaldehyde	Benzene	Acrolein	HAPS TOT
ARB 1	G3516TALE	19.4	110.0	4.3	0.0	5784.1	3.8	0.36	0.02	0.22	4.36
ARB 2	G3516TALE	19.4	110.0	4.3	0.0	5784.1	3.8	0.36	0.02	0.22	4.36
ARB 3	G3516TALE	19.4	110.0	4.3	0.0	5784.1	3.8	0.36	0.02	0.22	4.36
TK 1-3	Tank Emissions	-	-	10.9	-	112.1	-	-	0.16	-	1.61
L-1	Tank Truck Loading	-	-	Insig.	-	-	-	-	-	-	-
HTR 1	Line Heater	0.2	0.1	Insig.	-	160.1	-	-	-	-	-
FUG	Fugitives	-	-	3.8	-	-	-	-	-	-	-
Total		58.4	330.1	23.7	0.0	17624.5	11.3	1.1	0.2	0.7	14.7

PTE Emissions (TPY)											
Unit ID	Description	NOx	CO	VOC	PM10	CO2e	CH2O	Acetaldehyde	Benzene	Acrolein	HAPS TOT
ARB 1	G3516TALE	19.4	7.7	3.2	0.0	5784.1	0.9	0.36	0.02	0.22	1.51
ARB 2	G3516TALE	19.4	7.7	3.2	0.0	5784.1	0.9	0.36	0.02	0.22	1.51
ARB 3	G3516TALE	19.4	7.7	3.2	0.0	5784.1	0.9	0.36	0.02	0.22	1.51
TK 1-3	Tank Emissions	-	-	10.9	-	112.1	-	-	0.16	-	1.61
L-1	Tank Truck Loading	-	-	Insig.	-	-	-	-	-	-	-
HTR 1	Line Heater	0.2	0.1	Insig.	-	0.0	-	-	-	-	-
FUG	Fugitives	-	-	3.8	-	-	-	-	-	-	-
Total		58.4	23.2	20.5	0.0	17464.3	2.7	1.1	0.2	0.7	6.1

Per guidance, PTE accounts for legally and practically enforceable restrictions (emission controls).

Appendix F

Detailed Emission Calculation

Archie Bench Compressor Station
Engine Detail Sheet

Source ID Number	ARB 1		
Source Description	4-Cycle Lean Burn		
Engine Usage	Compressor Engine		
Engine Make	Caterpillar	Potential operation	8760 hr/yr
Engine Model	G3516TALE		
Serial Number	4EK04160	Manufacture Date	8/25/2004
Date in Service	4/13/2005	Potential fuel usage	96.2 MMscf/yr
Emission Controls	Lean Burn		10979 scf/hr
	Oxidation Catalyst/AFR		
		Stack ID	ARB 1
Engine Rating	1340 BHP	Stack Height	ft
Fuel Heating Value	905.0 Btu/scf	Stack Diameter	1.0 ft
Heat Rate	9.94 MMBtu/hr	Exit Velocity	78.4 ft/s
Engine Heat Rate	7415 Btu/hp-hr	Exit Temperature	840 deg F
		Volume Flow Rate	3,690 ft ³ /min

Uncontrolled Emissions

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	19.4	Manuf. Data
CO	2.53	8.50	25.11	110.0	Manuf. Data
VOC	0.10	0.33	0.97	4.3	Manuf. Data
SOx	5.88E-04	0.002	0.01	0.03	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
CO ₂ e	132.9	447.0210	1320.56	5784.07	GHG Subpart C Calc.
HAPs					lb/yr
HCHO	0.09	0.29	0.86	3.75	Manuf. Data 7504.8
Benzene	4.40E-04	0.0015	0.004	0.02	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	0.22	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	0.36	AP-42, Table 3.2-2 727.7
				4.36	

PTE Emissions

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	19.4	Manuf. Data
CO*	0.18	0.60	1.76	7.7	Manuf. Control Data
VOC*	0.07	0.25	0.73	3.2	Manuf. Data
SOx	5.88E-04	0.002	0.01	0.03	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
HAPs					
HCHO*	0.02	0.07	0.21	0.90	Manuf. Control Data 1801.2
Benzene	4.40E-04	0.0015	0.004	0.02	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	0.22	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	0.36	AP-42, Table 3.2-2 727.7

*CO: 93% Control Efficiency; VOC: 25% Control Efficiency; Formaldehyde: 76% Control Efficiency

Archie Bench Compressor Station
Engine Detail Sheet

Source ID Number	ARB 2		
Source Description	4-Cycle Lean Burn		
Engine Usage	Compressor Engine		
Engine Make	Caterpillar	Potential operation	8760 hr/yr
Engine Model	G3516TALE		
Serial Number	WPW00196	Manufacture Date	5/25/2006
Date in Service	2/12/2007	Potential fuel usage	96.2 MMscf/yr
Emission Controls	Lean Burn		10979 scf/hr
	Oxidation Catalyst/AFR		
Engine Rating	1340 BHP	Stack ID	ARB 2
Fuel Heating Value	905.0 Btu/scf	Stack Height	ft
Heat Rate	9.94 MMBtu/hr	Stack Diameter	1.0 ft
Engine Heat Rate	7415 Btu/hp-hr	Exit Velocity	78.4 ft/s
		Exit Temperature	840 deg F
		Volume Flow Rate	3,690 ft³/min

Uncontrolled Emissions

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	19.4	Manuf. Data
CO	2.53	8.50	25.11	110.0	Manuf. Data
VOC	0.10	0.33	0.97	4.3	Manuf. Data
SOx	5.88E-04	0.002	0.01	0.03	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
CO2e	132.9	447.0	1320.6	5784.1	GHG Subpart C Calc.
HAPs					lb/yr
HCHO	0.09	0.29	0.86	3.75	Manuf. Data 7504.8
Benzene	4.40E-04	0.0015	0.004	0.02	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	0.22	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	0.36	AP-42, Table 3.2-2 727.7
				4.36	

PTE Emissions

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	19.4	Manuf. Data
CO*	0.18	0.60	1.76	7.7	Manuf. Control Data
VOC*	0.07	0.25	0.73	3.2	Manuf. Data
SOx	5.88E-04	0.002	0.01	0.03	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
HAPs					
HCHO*	0.02	0.07	0.21	0.90	Manuf. Control Data 1801.2
Benzene	4.40E-04	0.0015	0.004	0.02	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	0.22	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	0.36	AP-42, Table 3.2-2 727.7

*CO: 93% Control Efficiency; VOC: 25% Control Efficiency; Formaldehyde: 76% Control Efficiency

Archie Bench Compressor Station
Engine Detail Sheet

Source ID Number	ARB 3		
Source Description	4-Cycle Lean Burn		
Engine Usage	Compressor Engine		
Engine Make	Caterpillar	Potential operation	8760 hr/yr
Engine Model	G3516TALE		
Serial Number	WPW00708	Manufacture Date	1/30/2007
Date in Service	1/17/2008	Potential fuel usage	96.2 MMscf/yr
Emission Controls	Lean Burn		10979 scf/hr
	Oxidation Catalyst/AFR		
		Stack ID	ARB 3
Engine Rating	1340 BHP	Stack Height	ft
Fuel Heating Value	905.0 Btu/scf	Stack Diameter	1.0 ft
Heat Rate	9.94 MMBtu/hr	Exit Velocity	78.4 ft/s
Engine Heat Rate	7415 Btu/hp-hr	Exit Temperature	840 deg F
		Volume Flow Rate	3,690 ft ³ /min

Uncontrolled Emissions

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	19.4	Manuf. Data
CO	2.53	8.50	25.11	110.0	Manuf. Data
VOC	0.10	0.33	0.97	4.3	Manuf. Data
SOx	5.88E-04	0.002	0.01	0.03	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
CO2e	132.9	447.0	1320.6	5784.1	GHG Subpart C Calc.
HAPs					lb/yr
HCHO	0.09	0.29	0.86	3.75	Manuf. Data 7504.8
Benzene	4.40E-04	0.0015	0.004	0.02	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	0.22	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	0.36	AP-42, Table 3.2-2 727.7
				4.36	

PTE Emissions

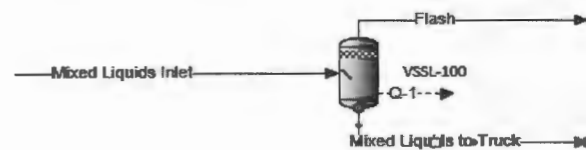
Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	19.4	Manuf. Data
CO*	0.18	0.60	1.76	7.7	Manuf. Control Data
VOC*	0.07	0.25	0.73	3.2	Manuf. Data
SOx	5.88E-04	0.002	0.01	0.03	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	0.00	AP-42, Table 3.2-2
HAPs					
HCHO*	0.02	0.07	0.21	0.90	Manuf. Control Data 1801.2
Benzene	4.40E-04	0.0015	0.004	0.02	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	0.22	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	0.36	AP-42, Table 3.2-2 727.7

*CO: 93% Control Efficiency; VOC: 25% Control Efficiency; Formaldehyde: 76% Control Efficiency

Names	Units	Flash
Carbon Dioxide(Mass Flow)	ton/yr	0.75
Methane(Mass Flow)	ton/yr	5.3
Benzene(Mass Flow)	ton/yr	0.16
Toluene(Mass Flow)	ton/yr	0.12
Ethylbenzene(Mass Flow)	ton/yr	0.0049
p-Xylene(Mass Flow)	ton/yr	0.021
n-Hexane(Mass Flow)	ton/yr	1.3

Annual tank loss calculations for "Mixed Liquids Inlet".
 Flashing losses are 10.88 ton/yr.
 * Only Non-Exempt VOC are reported.

Tank-



Names	Units	Mixed Liquids Inlet	Flash	Mixed Liquids to Truck
Carbon Dioxide(Mole Fraction)	%	0.0073	2.7	0.0015
Nitrogen(Mole Fraction)	%	7.7e-06	0.036	6e-07
Methane(Mole Fraction)	%	0.12	54	0.0024
Ethane(Mole Fraction)	%	0.025	11	0.0021
Propane(Mole Fraction)	%	0.028	10	0.0064
i-Butane(Mole Fraction)	%	0.013	3.5	0.0058
n-Butane(Mole Fraction)	%	0.026	5.7	0.014
i-Pentane(Mole Fraction)	%	0.024	2.8	0.018
n-Pentane(Mole Fraction)	%	0.028	2.5	0.022
Hexane(Mole Fraction)	%	0.1	0.9	0.1
n-Octane(Mole Fraction)	%	0.083	0.21	0.083
Nonane(Mole Fraction)	%	0.013	0.0094	0.013
C10 +(Mole Fraction)	%			
Benzene(Mole Fraction)	%	0.014	0.33	0.013
Toluene(Mole Fraction)	%	0.028	0.21	0.028
Ethylbenzene(Mole Fraction)	%	0.0033	0.0075	0.0033
p-Xylene(Mole Fraction)	%	0.014	0.033	0.014
n-Hexane(Mole Fraction)	%	0.088	2.4	0.083
Liquid Volumetric Flow	bwld	113.62	284.39	85.279

Annual tank loss calculations for "Mixed Liquids Inlet".
 Total working and breathing losses from the Vertical Cylinder are 0.01178 ton/yr.
 Loading losses are 0.01069 ton/yr of loaded liquid.
 * Only Non-Exempt VOC are reported.

Tank

**Archie Bench Compressor Station
Annual Condensate Throughput**

		Condensate Production	Average Production	Water Production	Average Production	Combined Production	Average Production
Year	Month	bbls/month	bbls/day	bbls/month	bbls/day	bbls/month	bbls/day
2014	Jan	145	5	3980	128	4125	137.5
	Feb	280	10	3290	106	3570	119.0
	Mar	235	8	4055	131	4290	143.0
	Apr	260	9	3299	106	3559	118.6
	May	320	10	2847	92	3167	105.6
	Jun	220	7	2500	81	2720	90.7
	Jul	10	0	2484	80	2494	83.1
	Aug	40	1	2100	68	2140	71.3
	Sep	185	6	2375	77	2560	85.3
	Oct	150	5	2810	91	2960	98.7
	Nov	170	6	2230	72	2400	80.0
	Dec	290	9	2270	73	2560	85.3
2015	Jan	365	12	2035	66	2400	80.0
	Feb	370	13	1630	53	2000	66.7
	Mar	330	11	1800	58	2130	71.0
	Apr	210	0	1630	53	1840	61.3
	May	260	8	2300	74	2560	85.3
	Jun	120	4	2020	65	2140	71.3
	Jul	0	0	1280	41	1280	42.7
	Aug	0	0	720	23	720	24.0
	Sep	0	0	480	15	480	16.0
	Oct	0	0	560	18	560	18.7
	Nov	0	0	1110	36	1110	37.0
	Dec	0	0	2320	75	2320	77.3
Average Daily Production			6		67		75

Max 2015 Avg Daily Production

85.3

Archie Bench Compressor Station
Heater Emission Calculation Sheet
Insignificant Source

Heater Data	
ID	HTR 1
Description	Line Heater
Nameplate Rating:	0.25 (MMBtu/hr)
Efficiency:	0.80 (decimal)
Heat Input:	0.31 (MMBtu/hr)
Operation:	8760 (hr/yr)
Fuel Heat Value:	1200.0 (Btu/scf)
VOC Wt Fraction:	0.07 (decimal, VOC weight fraction of the fuel gas)

Emission Factors				
	NO _x	CO	TOC	CH ₂ O
lb/MMscf	100	84	11	0.075
Adjusted lb/MMscf *	117.6	87.7	12.9	0.09
lb/MMBtu	0.115	0.086	0.013	0.000

* Emission factor conversion based on footnote "a" of AP-42 Table 1.4-1 to convert from 1.020 Btu/scf to the above Fuel Heat Value in units of Btu/scf.

Emission Calculations							
NO _x		CO		VOC		CH ₂ O	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
0.04	0.16	0.03	0.12	0.00	0.00	0.00	0.00

CO ₂ e Emission Calculations			
Conversions:			
1 Metric Ton =	2204.62	lbs	
1 kg =	0.001	metric tons	
Pollutant	kg/mmbtu	metric ton	tpy
CO ₂	53.02	145	159.99
CH ₄	0.001	0.0	0.00
N ₂ O	0.0001	0.0	0.00
CO _{2e} =			160
CO _{2e} = CO ₂ + (CH ₄ *21) + (N ₂ O*310)			

Archie Bench Compressor Station
Fugitives Detail Sheet

Component Source Counts for Gas Plant/Compressor Station Units

Equipment Type	Compressor	Separator	Condensate Tank	TEG Unit	DEA Unit	C3 Refrig Skid	Expan Demeth	Mole Sieve System	Flare
For this facility, Number of Units	3	6	3	0	0	0	0	0	0
Valves - Inlet Gas	40	6	4	75	15	40	40	25	8
Valves - Liquid	5	4	6	20	60	35	35	0	2
Relief Valves	2	2	2	4	4	6	6	4	2
Pump Seals - Liquid	0	0	2	4	4	0	0	0	0
Flanges/Connectors - Inlet Gas	150	50	50	250	250	250	250	100	75
Flanges/Connectors - Liquid	10	10	10	20	20	20	20	20	10
Compressor Seals	4	0	0	0	0	6	0	0	0

Fugitives

Equipment Type	Emission Factor (lb/hr/source)	Source Count*	% VOC	C3+	%HAP	VOC Emission Rate (lb/hr)	HAP Emission Rate (lb/hr)	HAP Emission Rate (tpy)	VOC Emission Rate (tpy)
Valves - Inlet Gas	0.00992	168	11.40%		0.12%	0.190	0.062	0.005	0.83
Valves - Liquid	0.00550	57	100.00%		11.40%	0.314	0.036	0.157	1.37
Relief Valves	0.01940	24	11.40%		0.12%	0.053	0.001	0.002	0.23
Pump Seals - Liquid	0.02866	6	100.00%		11.40%	0.172	0.020	0.086	0.75
Flanges/Connectors - Inlet Gas	0.00086	900	11.40%		0.12%	0.088	0.001	0.004	0.39
Flanges/Connectors - Liquid	0.00024	120	100.00%		11.40%	0.029	0.003	0.014	0.13
Compressor Seals	0.01940	12	11.40%		0.12%	0.027	0.000	0.001	0.12
Total						0.872	0.062	0.27	3.82

* Source counts estimated from similar facilities. These counts are not actuals.

Source: EPA Protocol for Equipment Leak Emission Estimates, November, 1995, EPA-453/R-95-017

Appendix G

Regulatory Analysis

Regulatory Analysis

40 CFR 60 - New Source Performance Standards (NSPS)

Subpart A: General Provisions. This subpart applies to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication of any standard in part 60. The general provisions under subpart A apply to sources that are subject to the specific subparts of part 60. This facility is not subject to specific subparts of part 60; therefore, the General Provisions of part 60 do not apply.

Subpart Dc Standards of Performance for Small Industrial, Commercial, Institutional Steam Generating Units, applies to steam generating units having a capacity between 10 MMBtu/hr and 100 MMBtu/hr that are construction, reconstructed or modified after June 9, 1989. There are no emission units that meet the definition of a steam generating unit at this facility. Therefore, the requirements of subpart Dc do not apply.

Subpart Kb Standards of Performance for Volatile Organic Liquid Storage Vessels, applies to each storage vessel with a capacity greater than or equal to 75 cubic meters used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. There are no storage tanks greater than 75 cubic meters that store volatile organic liquids at this facility which vent emissions to the atmosphere, therefore Subpart Kb does not apply.

Subpart KKK Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants apply to affected facilities in onshore natural gas processing plants that commenced construction, modification or reconstruction after January 20, 1984. A natural gas processing plant is defined in the Subpart as any site “engaged in the extraction of natural gas liquids from field gas”. This facility does not contain processes which extract natural gas liquids from field gas. Therefore, this rule does apply.

Subpart LLL Standards of Performance for Onshore Natural Gas Processing; SO₂ Emissions. This rule applies to sweetening units and sulfur recovery units at onshore natural gas processing facilities. This facility is not an onshore natural gas processing facility. Therefore, this rule does not apply.

Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to manufacturers, owners and operators of stationary compression ignition (CI) internal combustion engines (ICE). There are no stationary compression ignition engines at this site, therefore Subpart IIII does not apply.

Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines applies to manufacturers, owners and operators of stationary spark ignition (SI) internal combustion engines (ICE). This applies to engines that were ordered from the manufacturer after June 12, 2006 and;

- Are greater than 500 hp and manufactured after July 1, 2007 or
- Lean burn engines greater than 500 hp but less than 1,350 hp and manufactured after January 1, 2008

Engines ARB #1, ARB #2, and ARB #3 are lean burn engines greater than 500 hp but less than 1,350 hp that were manufactured prior to January 1, 2008; therefore, subpart JJJJ does not apply to these engines.

Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution. This subpart establishes emissions standards and compliance schedules for the control of VOCs and SO₂ emissions from affected facilities that commenced construction, modification or reconstruction after August 23, 2011. The rule applies to equipment leaks at onshore natural gas processing plants and compressors. This facility is not a natural gas processing plant and compressors were constructed prior to August 23, 2011; therefore, subpart OOOO is not applicable.

40 CFR 61 - National Emission Standards for Hazardous Air Pollutants

Subpart V National Emission Standard for Equipment Leaks (Fugitive Emission Sources). This subpart applies to sources that are intended to operate in volatile hazardous air pollutant (VHAP) service. Based on engineering judgment, historical and recent gas composition and facility process it can be predicted that the percent VHAP content will never exceed 10 percent by weight; therefore Subpart V is not an applicable regulation for the facility.

40 CFR 63 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

Subpart HH National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities, applies to glycol dehydration units, storage vessels with potential for flash emissions, and ancillary equipment operating in volatile hazardous air pollutant service that is located at a natural gas processing plant which is a major source of HAPS. This facility is not a natural gas processing plant therefore Subpart HH does not apply.

Subpart HHH National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities. This rule applies to natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user, and that are a major source of HAP emissions. This subpart does not apply to this facility because it does not meet the definition of a Natural Gas Transmission and Storage Facility

Subpart EEEE National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline). This rule establishes national emission limitations, operating limits, and work practice standards for organic HAPs emitted from organic liquids distribution operations at major sources of HAP emissions. In this subpart, organic liquids distribution operations do not include oil and natural gas production field facilities as defined in subpart HH or natural gas transmission and storage facilities as defined in subpart HHH. This facility meets the definition an oil and natural gas production field facility as defined in §63.761 of subpart HH. Therefore, this rule does not apply.

Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) establishes national emission limitations and operating limitations for HAPs emitted from stationary reciprocating internal combustion engines, and requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. This facility is an area source of HAPs; therefore, the facility is not subject to major source ZZZZ requirements. All engines (emission units ARB 1 through ARB 3) at the facility are subject to the August 20, 2010 revisions to MACT ZZZZ for existing units at areas sources of HAPs. This facility is by definition a remote sources and will comply with applicable requirements of this regulation.

40 CFR 98 – Green House Gas Reporting

Subpart A, General Provisions applies to a facility that contains any source category (as defined in subparts C through JJ of this part) that is listed in this paragraph (a)(2) in any calendar year starting in 2010 and that emits 25,000 metric tons CO₂e or more per year in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all source categories that are listed in this regulation. The facility is subject to the reporting requirements of Subpart C and Subpart W.